

REMARKS

Claims 1-4 and 24 presently appear in this case. Claims 1-4 have been allowed, and claim 24 has been rejected under 35 U.S.C. 112. The Official Action of October 10, 2000, has now been carefully studied. Reconsideration and allowance are respectfully urged.

Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 24 is said to be indefinite because it recites Gly-20 in the second to last line, but there is no glycine at that position. Claim 24 is also rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner alleges that the new matter includes use of a sense primer encoding a part of SEQ ID NO:3 in the region of amino acid -22 to -1, and an antisense primer from the encoding region of amino acids 177-374, as well as conservation of amino acid residues corresponding to Glu-155 and one or more of Ala-14, Gly-20, and Ala-46 of the amino acid sequences of SEQ ID NO:1.

This rejection is respectfully traversed. Claim 24 has now been amended to delete reference to Gly-20 and to recite more positively how the protein is obtained. That is, claim 24

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has now been amended to claim a purified human Desert hedgehog protein obtained by expression of a DNA which comprises a 528-nucleotide sequence amplifiable from a human cDNA sequence by polymerase chain reaction using a sense primer having the nucleotide sequence of SEQ ID NO:27 in combination with an antisense primer having the nucleotide sequence of SEQ ID NO:28 and encodes a contiguous amino acid sequence which contains the amino acid residue Glu-155. Support for the amendments to claim 24 can be found in the specification as filed at pages 19-38, namely, Example 1 to Example 3.

Example 1, beginning on page 19, described the process used to prepare the human cDNA. An RNA was isolated from human ARH-77 cells (*cf.* Example 1-1(a)), and the first strand cDNA was prepared using the RNA (*cf.* Example 1-1(b)). The human cDNA, *i.e.*, the DNA having the nucleotide sequence of SEQ ID NO:7, was amplified using the first strand cDNA as a template (*cf.* Example 1-1(c)).

Example 2, beginning on page 33, describes that the DNA which comprises the nucleotide sequence of SEQ ID NO:4 was obtained by PCR using the cDNA as a template and a sense primer having the nucleotide sequence of SEQ ID NO:27 in combination with an antisense primer having the nucleotide sequence of SEQ ID NO:28. It should be noted that nucleotide sequence SEQ ID NO:24 is a 528 nucleotide sequence and encodes a contiguous amino acid sequence which contains the amino acid residue Glu-155.

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Example 3, beginning on page 36, describes production of the hedgehog protein by expression of the DNA obtained in Example 2.

Therefore, amended claim 24 recites the process as described in the specification as filed. It is believed that the subject matter of amended claim 24 was fully appreciated by the inventors at the time the application was filed, and that amended claim 24 is not indefinite. The recitation "Gly-20" has been eliminated from this claim.

It is respectfully submitted that the human Desert hedgehog protein as claimed in amended claim 24 is distinct from mouse Indian hedgehog protein of the prior art because these two proteins have different origins. It is also respectfully submitted that the human Desert hedgehog protein as recited in amended claim 24 is distinct from both human Sonic hedgehog protein and human Indian hedgehog protein of the prior art because they can be distinguished by their respective structures.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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24. A purified human Desert hedgehog protein obtainable by expression of a DNA ~~isolated from a human cell,~~ wherein the ~~DNA~~which comprises a ~~nucleotide~~528-nucleotide sequence amplifiable by from a human cDNA polymerase chain reaction using a sense primer ~~encoding a part of~~having the ~~amino acid~~nucleotide sequence of SEQ ID NO:3 ~~in the region of~~ the ~~amino acids 22 to 127~~ in combination with an antisense primer ~~complementary to~~having the ~~nucleotide sequence~~ ~~encoding a part of the amino acid~~ sequence of SEQ ID NO:3 ~~in the region of the amino acids 177 to 374~~28 and encodes a contiguous amino acid sequence which ~~conserves~~contains the amino acid ~~residues corresponding to~~residue Glu-155 ~~and one or more residues selected from the group consisting of Ala-14, Gly-20, and Ala-46 of the amino acid sequence of SEQ ID NO:1.~~